

PAJ website translation of JP 11-084212 A

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TECHNICAL FIELD

[Field of the Invention]This invention is used for imaging devices which photo a picture, such as a video camera or a digital still camera, for example, and relates to the zoom operation of a suitable taken image, etc.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]In an imaging device in recent years, there are some to which zooming speed is changed according to rocking quantity, such as a lever which performs a user's zoom operation, in the zoom operation which adjusts the field angle of a taken image.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, setting out of the zoom speed suitable for a photography person's liking is possible according to the movement magnitude from the stop position of a control lever. Since the present zoom speed is displayed on an indicator, it can be judged easily with which zoom speed level it is operating to the user. [0054]Since the top delivery lever which reproduces the still picture recorded as the control lever which performs zoom control one by one is made to serve a double purpose in a still picture when record reproduction is possible, the miniaturization of a device is realizable.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, in the conventional imaging device, since zooming speed was beforehand set up according to the movement magnitude of a

lever, zoom operation which was adapted for a photography person's liking was not necessarily able to be performed. The photography person has not grasped [with what kind of velocity level the present zooming speed is performed, and].

[0004]This invention cancels the problem mentioned above and an object of this invention further is to attain the miniaturization of an imaging device.

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MEANS

[Means for Solving the Problem]According to the invention concerning claim 1, this invention is characterized by that an imaging device provided with a zooming means which enables change of image pick-up magnification comprises the following, in order to attain the above purpose.

A control lever for inputting said zoom control instructions into said zooming means.

A setting-out means to set up a variation speed level of image pick-up magnification corresponding to a movement zone of said control lever.

[0006]According to the invention concerning claim 2, in claim 1, have a detection means to detect a movement zone of said control lever, and said zooming means, It is constituted so that image pick-up magnification may be changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection means.

[0007]According to the invention concerning claim 3, in claim 2, it has a displaying means for displaying a taken image, and a velocity level displaying means for displaying a variation speed level of image pick-up magnification controlled by said zooming means on said displaying means.

[0008]According to the invention concerning claim 4, it has a memory measure which memorizes a variation speed level of image pick-up magnification set up by said setting-out means in claim 2 respectively corresponding to a movement zone of said control lever, Said zooming means changes image pick-up magnification with a called variation speed level by calling a variation speed level of image pick-up magnification

corresponding to a movement zone of said detected control lever from said memory measure.

[0009]According to the invention concerning claim 5, in claim 3, setting out of a variation speed level of image pick-up magnification by said setting-out means is constituted so that it can set up on said displaying means.

[0010]According to the invention concerning claim 6, said imaging device is provided with a recording device for recording a still picture in any 1 paragraph of claim 1 thru/or claim 5.

[0011]According to the invention concerning claim 7, in claim 6, it has a control means which switches an output of a still picture recorded when said imaging device was in image restoration mode one by one according to movement of said control lever.

[0012]According to the invention concerning claim 8, in claim 7, said control means is constituted so that an output of a still picture may be switched one by one in proportion to a variation speed level of image pick-up magnification set up by said setting-out means.

[0013]In a control method of an imaging device which is provided with a zoom process of enabling change of image pick-up magnification according to the invention concerning claim 9, It corresponds to a movement zone of a control lever for inputting said zoom control instructions into said zoom process, Have a setting-out process of setting up a variation speed level of image pick-up magnification, and a detection process which detects a movement zone of said control lever, and said zoom process, Processing to which image pick-up magnification is changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection process is performed.

[0014]According to the invention concerning claim 10, in claim 9, said imaging device can record a still picture,It has a control process of switching an output of a still picture recorded when it was in image restoration mode which reproduces a recorded still picture one by one according to movement of said control lever.

[0015]In a storage which memorized a program which performs operation processing of an imaging device which is provided with a zoom processing function to change image pick-up magnification according to the invention concerning claim 11, It corresponds to a movement zone of a control lever for inputting zoom control instructions, A program which performs processing to which image pick-up magnification is changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever which made a variation speed level of image pick-up magnification set up, was made to detect a movement zone of said control lever, and was made to detect is memorized.

[0016]According to the invention concerning claim 12, in claim 11, said imaging device can record a still picture, A program which performs processing to which an output of a still picture recorded when it was in image restoration mode which reproduces a recorded still picture is made to be switched one by one according to movement of said control lever is memorized.

[0017]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described over an attached drawing.

[0018](A 1st embodiment) Drawing 1 is a block diagram of the imaging device of this embodiment. In the figure, the microcomputer 1 is the whole imaging device a

microcomputer (a microcomputer is called hereafter) which carries out generalization control, and the status signal generation circuit 2, In order to display setting out of the zoom speed of a camera, etc. on a picture, the status signal for mixing with a video signal by the control command from the microcomputer 1 is generated. The adding machine 7 makes a status signal and a video signal mix.

[0019]The lens unit 3 is the lens group provided with a zoom lens, a focus lens, etc., and the lens drive circuit 14 makes the lens in the lens unit 3 drive appropriately. CCD4 changes into an electric signal the optical image which entered via the lens unit 3. The camera signal processing circuit 5 performs processing which the output of CCD4 is changed into the video signal with which NTSC etc. were standardized, and the video signal processing circuit 6 records the video signal on recording media, such as magnetic tape, and plays the video signal from a recording medium. The indicator 8 is EVF or the monitor constituted by LCD etc., and displays the taken image in which the adder circuit 7 was overlapped on the display of setting out of a camera, etc.

[0020]It is removable, and the recording medium 9 is constituted by magnetic tape, semiconductor memory, etc., and the record reproduction circuit 10, The video signal which made incorporate a video signal into the recording medium 9 from the video signal processing circuit 6, and was recorded in the recording medium 9 is made to output to the video signal processing 6 based on instructions of the microcomputer 1.

[0021]11 is the various operation switch groups for performing record of a taken image or performing various setting out of a video camera, etc. 13 is a control lever which can change zoom speed, when resistance changes with the movement magnitude of a lever, and the zoom speed configuration switch group 12 is a switch group which sets up the zoom speed according to the movement magnitude of the control lever 13.

[0022]In the zoom speed configuration switch group 12, SW1 is a switch for making it the setting screen which sets up zoom speed as shown in drawing 5 on the indicator 8, and when the SW1 is pushed in the state where the setting screen is displayed further, the display of the setting screen disappears. SW2 is a switch for becoming final and conclusive setting out of zoom speed, and SW3-SW6 are the buttons for moving the cursor displayed in a setting screen.

[0023]RAM15 memorizes the zoom speed corresponding to the movement magnitude of the control lever set up by the alter operation of the zoom configuration switch group. ROM18 has memorized the program which controls an imaging device and the microcomputer 1 performs operation processing of the whole imaging device based on the program by reading to RAM15.

[0024]Here, the composition of the control lever 13 is explained in detail using drawing 6 - drawing 8. Drawing 7 is a control lever of this embodiment, and it is divided in the direction of T (Tele) for every movement magnitude from a stop position, and it is divided into eight steps in the direction of W (Wide), respectively. The method of division may be except eight steps.

[0025]Drawing 8 is a figure showing how to detect the movement magnitude of the control lever 13. The variable resistor 701 detects the potential which changes according to the movement magnitude of the control lever 13.

[0026]Drawing 6 shows an example of the movement zone of the control lever 13 from the stop position according to a detection potential level, and the table of the zoom speed level corresponding to the movement zone. Such a table is memorized by RAM15. The

zoom speed level in drawing 6 can be set up by the below-mentioned processing. The microcomputer 1 judges the movement zone of the control lever corresponding to the detected potential using this table.

[0027]Drawing 4 is a screen usually displayed on the indicator 8. In drawing 4, the index 301 is a zoom speed level with which the present zoom is performed, and except when zoom is performed, it is not displayed.

[0028]Drawing 5 is a display screen which sets up zoom speed on the indicator 8. In drawing 5, the item of 403 shows the movement magnitude from the stop position of the control lever 13 shown in drawing 7. The item of 402 shows the velocity level corresponding to each of the movement magnitude of 403.

[0029]Drawing 2 is an operation processing flow chart of the microcomputer 1 in the case of setting up zoom speed. How to mix the display screen of the set menu of the zoom speed of drawing 5, and to change zoom speed in this embodiment is explained.

[0030]First, in s1, it is judged whether SW1 which is a MENU switch was turned on. When turned on, it progresses to s2 and it is judged whether the zoom speed setting-out flag is already set. If the flag is not set, a zoom speed setting-out flag is set in s3, and a setting-out display menu as shown in drawing 5 on the indicator 8 is displayed in s4. On the other hand, in s2, if the flag is already set, it will progress to s5, a zoom speed setting-out flag will be made a clearance, and it will return on the indicator 8 at a usual display screen as shown in drawing 4.

[0031]In s1, when SW1 is not turned on, in s7, it is judged whether the zoom speed setting-out flag is already set. Processing operation is not performed when the set of the flag is not performed. When the set of the flag has already been performed, it can judge that the setting screen as shown in drawing 5 is already displayed, and setting out of the zoom speed according to the movement magnitude of the control lever can be performed.

[0032]In s8, it judges whether SW3 was turned on or not, and when turned on, in s9, it moves so that the cursor 401 currently displayed on the setting screen of drawing 5 may direct a lower item.

[0033]In s10, it judges whether SW4 was turned on or not, and when turned on, in s11, it moves so that the cursor 401 currently displayed on the setting screen of drawing 5 may direct the upper item.

[0034]In s12, it judges whether SW5 was turned on or not, and when turned on, in s13, it displays so that the zoom speed level of the movement magnitude of the lever may be made ranked higher one time.

[0035]In s14, it judges whether SW6 was turned on or not, and when turned on, in s15, it displays so that one rank of zoom speed levels of the movement magnitude of the lever may be brought down.

[0036]In s16, it judges whether SW6 was turned on or not, and when turned on, RAM15 is made to memorize the zoom speed set up by progressing to S17 corresponding to the movement magnitude of a lever, respectively, and setting out of zoom speed is become final and conclusive.

[0037]In this embodiment, when setting out of zoom speed is made, as long as there is no change of setting out, even if it repeats ON/OFF operation, the setting out shall be saved in a power supply.

[0038]Drawing 3 is the flow chart which showed the zooming operation control management of the microcomputer 1 in the imaging device of this embodiment.

[0039]In s30, change of the potential of the variable resister 701 by the control lever 13 having moved is detected. And in s31, it is judged to which position the control lever 13 is moving the microcomputer 1 corresponding to the table (drawing 8) beforehand memorized by RAM15 based on the detected potential. In s32, the microcomputer 1 determines zoom speed corresponding to the position of the judged control lever.

[0040]In s33, the determined zoom speed level is displayed as shown in the index 301 of drawing 4, and in s34, zoom control is performed with the zoom speed level. As explained above, according to this embodiment, the zoom speed corresponding to each movement magnitude of the control lever can be changed by a user's liking. Zoom speed is controlled by which velocity level now, or judgment becomes possible easily.

[0041](A 2nd embodiment) The imaging device which showed this embodiment to a 1st embodiment enables still picture record of a picture.

[0042]Drawing 9 is a configuration block figure of the imaging device of this embodiment, and drawing 10 and drawing 11 are the perspective views of the imaging device of this embodiment.

[0043]In drawing 9, mode change SW16 is a switch which switches the mode of record/reproduction of an imaging device, make it record on the recording medium 9 at the time of a recording mode, and a taken image at the time of reproduction mode. It is possible to read the image data memorized in the recording medium, and to display a picture on the indicator 8. Mode change SW16 is making control of ON/OFF of the power supply of the main part of an imaging device serve a double purpose. 17 is an external output terminal and is outputting the imaging data processed by the video signal processing circuit 6.

[0044]Since the composition of other numerals is the same as the composition of the numerals shown in drawing 1, respectively, the explanation is omitted.

[0045]Drawing 12 is an operation processing flow chart of the microcomputer 1 when a control lever is operated in the imaging device of this embodiment.

[0046]First, in s40, it is judged whether the power supply is inputted. When it is judged that the power supply is inputted, it progresses to s41 and it is judged whether mode change SW16 is a recording mode or it is reproduction mode. When judged as a recording mode, processing of s30-s34 is performed. Since processing of s30-s34 is the same as the processing shown in drawing 3, the explanation is omitted.

[0047]On the other hand, in s41, when it is judged that it is reproduction mode, the picture first recorded on the indicator 8 is displayed, and it progresses to s42. In s42, the output change of the potential of the variable resister by the control lever 13 having been operated is detected. In s43, the movement zone of the control lever 13 is judged with reference to the table (drawing 6) memorized by RAM15.

[0048]In s44, although the zoom speed level is set up corresponding to the movement zone of the control lever, the top feed rate of the reproduced image outputted from the recording medium 9 by the velocity level proportional to the zoom speed level is determined. In s45, the recorded reproduced image is displayed in order based on the determined top feed rate.

[0049]The picture recorded on the forward direction to the time-axis in this embodiment while the control lever 13 was moving in the direction of T is reproduced, While the control lever 13 is moving in the direction of W, the picture recorded on the opposite direction to the time-axis shall be reproduced, but it is not this limitation.

[0050]In this embodiment, as explained above, since it is made to serve a double purpose as a top delivery control switch of the still picture which reproduces a zoom switch at the time of reproduction mode and the number of switches can be lessened, the miniaturization of an imaging device can be realized and operativity can be improved. Since the top feed rate of a still picture is determined corresponding to the zoom speed according to the movement magnitude from the stop position of the lever set up beforehand, it is not necessary to newly set up the top feed rate of the still picture corresponding to the movement magnitude of the control lever.

[0051]In a 1st and 2nd embodiment, although the zooming means which adjusts a field angle used the optical means, even if the electronic zoom which performs zoom electronically is used or it makes optical zoom and electronic zoom serve a double purpose, of course, it is possible to apply this embodiment.

[0052]In a 1st and 2nd embodiment, a setting-out means corresponds to a zoom speed configuration switch group, the microcomputer 1, and the status signal generation circuit 2. A zooming means corresponds to the microcomputer 1, the lens drive circuit 14, and the lens unit 3. A detection means corresponds to the variable resistor 701. A displaying means corresponds to the indicator 8. A velocity level displaying means corresponds to the status signal generation circuit 2, the adder circuit 7, and the indicator 8. A recording device corresponds to the record reproduction circuit 10 and the recording medium 9. A control means corresponds to the microcomputer 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention is used for imaging devices which photo a picture, such as a video camera or a digital still camera, for example, and relates to the zoom operation of a suitable taken image, etc.

[0002]

[Description of the Prior Art]In an imaging device in recent years, there are some to

which zooming speed is changed according to rocking quantity, such as a lever which performs a user's zoom operation, in the zoom operation which adjusts the field angle of a taken image.

[0003]

[Problem(s) to be Solved by the Invention]However, in the conventional imaging device, since zooming speed was beforehand set up according to the movement magnitude of a lever, zoom operation which was adapted for a photography person's liking was not necessarily able to be performed. The photography person has not grasped [with what kind of velocity level the present zooming speed is performed, and].

[0004]This invention cancels the problem mentioned above and an object of this invention further is to attain the miniaturization of an imaging device.

[0005]

[Means for Solving the Problem]According to the invention concerning claim 1, this invention is characterized by that an imaging device provided with a zooming means which enables change of image pick-up magnification comprises the following, in order to attain the above purpose.

A control lever for inputting said zoom control instructions into said zooming means.

A setting-out means to set up a variation speed level of image pick-up magnification corresponding to a movement zone of said control lever.

[0006]According to the invention concerning claim 2, in claim 1, have a detection means to detect a movement zone of said control lever, and said zooming means, It is constituted so that image pick-up magnification may be changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection means.

[0007]According to the invention concerning claim 3, in claim 2, it has a displaying means for displaying a taken image, and a velocity level displaying means for displaying a variation speed level of image pick-up magnification controlled by said zooming means on said displaying means.

[0008]According to the invention concerning claim 4, it has a memory measure which memorizes a variation speed level of image pick-up magnification set up by said setting-out means in claim 2 respectively corresponding to a movement zone of said control lever, Said zooming means changes image pick-up magnification with a called variation speed level by calling a variation speed level of image pick-up magnification corresponding to a movement zone of said detected control lever from said memory measure.

[0009]According to the invention concerning claim 5, in claim 3, setting out of a variation speed level of image pick-up magnification by said setting-out means is constituted so that it can set up on said displaying means.

[0010]According to the invention concerning claim 6, said imaging device is provided with a recording device for recording a still picture in any 1 paragraph of claim 1 thru/or claim 5.

[0011]According to the invention concerning claim 7, in claim 6, it has a control means which switches an output of a still picture recorded when said imaging device was in image restoration mode one by one according to movement of said control lever.

[0012]According to the invention concerning claim 8, in claim 7, said control means is

constituted so that an output of a still picture may be switched one by one in proportion to a variation speed level of image pick-up magnification set up by said setting-out means.

[0013]In a control method of an imaging device which is provided with a zoom process of enabling change of image pick-up magnification according to the invention concerning claim 9, It corresponds to a movement zone of a control lever for inputting said zoom control instructions into said zoom process, Have a setting-out process of setting up a variation speed level of image pick-up magnification, and a detection process which detects a movement zone of said control lever, and said zoom process, Processing to which image pick-up magnification is changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection process is performed.

[0014]According to the invention concerning claim 10, in claim 9, said imaging device can record a still picture, It has a control process of switching an output of a still picture recorded when it was in image restoration mode which reproduces a recorded still picture one by one according to movement of said control lever.

[0015]In a storage which memorized a program which performs operation processing of an imaging device which is provided with a zoom processing function to change image pick-up magnification according to the invention concerning claim 11, It corresponds to a movement zone of a control lever for inputting zoom control instructions, A program which performs processing to which image pick-up magnification is changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever which made a variation speed level of image pick-up magnification set up, was made to detect a movement zone of said control lever, and was made to detect is memorized.

[0016]According to the invention concerning claim 12, in claim 11, said imaging device can record a still picture, A program which performs processing to which an output of a still picture recorded when it was in image restoration mode which reproduces a recorded still picture is made to be switched one by one according to movement of said control lever is memorized.

[0017]

[Embodiment of the Invention] Hereafter, an embodiment of the invention is described over an attached drawing.

[0018](A 1st embodiment) Drawing 1 is a block diagram of the imaging device of this embodiment. In the figure, the microcomputer 1 is the whole imaging device a microcomputer (a microcomputer is called hereafter) which carries out generalization control, and the status signal generation circuit 2, In order to display setting out of the zoom speed of a camera, etc. on a picture, the status signal for mixing with a video signal by the control command from the microcomputer 1 is generated. The adding machine 7 makes a status signal and a video signal mix.

[0019]The lens unit 3 is the lens group provided with a zoom lens, a focus lens, etc., and the lens drive circuit 14 makes the lens in the lens unit 3 drive appropriately. CCD4 changes into an electric signal the optical image which entered via the lens unit 3. The camera signal processing circuit 5 performs processing which the output of CCD4 is changed into the video signal with which NTSC etc. were standardized, and the video signal processing circuit 6 records the video signal on recording media, such as magnetic tape, and plays the video signal from a recording medium. The indicator 8 is EVF or the

monitor constituted by LCD etc., and displays the taken image in which the adder circuit 7 was overlapped on the display of setting out of a camera, etc.

[0020]It is removable, and the recording medium 9 is constituted by magnetic tape, semiconductor memory, etc., and the record reproduction circuit 10, The video signal which made incorporate a video signal into the recording medium 9 from the video signal processing circuit 6, and was recorded in the recording medium 9 is made to output to the video signal processing 6 based on instructions of the microcomputer 1.

[0021]11 is the various operation switch groups for performing record of a taken image or performing various setting out of a video camera, etc. 13 is a control lever which can change zoom speed, when resistance changes with the movement magnitude of a lever, and the zoom speed configuration switch group 12 is a switch group which sets up the zoom speed according to the movement magnitude of the control lever 13.

[0022]In the zoom speed configuration switch group 12, SW1 is a switch for making it the setting screen which sets up zoom speed as shown in drawing 5 on the indicator 8, and when the SW1 is pushed in the state where the setting screen is displayed further, the display of the setting screen disappears. SW2 is a switch for becoming final and conclusive setting out of zoom speed, and SW3-SW6 are the buttons for moving the cursor displayed in a setting screen.

[0023]RAM15 memorizes the zoom speed corresponding to the movement magnitude of the control lever set up by the alter operation of the zoom configuration switch group. ROM18 has memorized the program which controls an imaging device and the microcomputer 1 performs operation processing of the whole imaging device based on the program by reading to RAM15.

[0024]Here, the composition of the control lever 13 is explained in detail using drawing 6 - drawing 8. Drawing 7 is a control lever of this embodiment, and it is divided in the direction of T (Tele) for every movement magnitude from a stop position, and it is divided into eight steps in the direction of W (Wide), respectively. The method of division may be except eight steps.

[0025]Drawing 8 is a figure showing how to detect the movement magnitude of the control lever 13. The variable resister 701 detects the potential which changes according to the movement magnitude of the control lever 13.

[0026]Drawing 6 shows an example of the movement zone of the control lever 13 from the stop position according to a detection potential level, and the table of the zoom speed level corresponding to the movement zone. Such a table is memorized by RAM15. The zoom speed level in drawing 6 can be set up by the below-mentioned processing. The microcomputer 1 judges the movement zone of the control lever corresponding to the detected potential using this table.

[0027]Drawing 4 is a screen usually displayed on the indicator 8. In drawing 4, the index 301 is a zoom speed level with which the present zoom is performed, and except when zoom is performed, it is not displayed.

[0028]Drawing 5 is a display screen which sets up zoom speed on the indicator 8. In drawing 5, the item of 403 shows the movement magnitude from the stop position of the control lever 13 shown in drawing 7. The item of 402 shows the velocity level corresponding to each of the movement magnitude of 403.

[0029]Drawing 2 is an operation processing flow chart of the microcomputer 1 in the case of setting up zoom speed. How to mix the display screen of the set menu of the

zoom speed of drawing 5, and to change zoom speed in this embodiment is explained.

[0030]First, in s1, it is judged whether SW1 which is a MENU switch was turned on. When turned on, it progresses to s2 and it is judged whether the zoom speed setting-out flag is already set. If the flag is not set, a zoom speed setting-out flag is set in s3, and a setting-out display menu as shown in drawing 5 on the indicator 8 is displayed in s4. On the other hand, in s2, if the flag is already set, it will progress to s5, a zoom speed setting-out flag will be made a clearance, and it will return on the indicator 8 at a usual display screen as shown in drawing 4.

[0031]In s1, when SW1 is not turned on, in s7, it is judged whether the zoom speed setting-out flag is already set. Processing operation is not performed when the set of the flag is not performed. When the set of the flag has already been performed, it can judge that the setting screen as shown in drawing 5 is already displayed, and setting out of the zoom speed according to the movement magnitude of the control lever can be performed.

[0032]In s8, it judges whether SW3 was turned on or not, and when turned on, in s9, it moves so that the cursor 401 currently displayed on the setting screen of drawing 5 may direct a lower item.

[0033]In s10, it judges whether SW4 was turned on or not, and when turned on, in s11, it moves so that the cursor 401 currently displayed on the setting screen of drawing 5 may direct the upper item.

[0034]In s12, it judges whether SW5 was turned on or not, and when turned on, in s13, it displays so that the zoom speed level of the movement magnitude of the lever may be made ranked higher one time.

[0035]In s14, it judges whether SW6 was turned on or not, and when turned on, in s15, it displays so that one rank of zoom speed levels of the movement magnitude of the lever may be brought down.

[0036]In s16, it judges whether SW6 was turned on or not, and when turned on, RAM15 is made to memorize the zoom speed set up by progressing to S17 corresponding to the movement magnitude of a lever, respectively, and setting out of zoom speed is become final and conclusive.

[0037]In this embodiment, when setting out of zoom speed is made, as long as there is no change of setting out, even if it repeats ON/OFF operation, the setting out shall be saved in a power supply.

[0038]Drawing 3 is the flow chart which showed the zooming operation control management of the microcomputer 1 in the imaging device of this embodiment.

[0039]In s30, change of the potential of the variable resistor 701 by the control lever 13 having moved is detected. And in s31, it is judged to which position the control lever 13 is moving the microcomputer 1 corresponding to the table (drawing 8) beforehand memorized by RAM15 based on the detected potential. In s32, the microcomputer 1 determines zoom speed corresponding to the position of the judged control lever.

[0040]In s33, the determined zoom speed level is displayed as shown in the index 301 of drawing 4, and in s34, zoom control is performed with the zoom speed level. As explained above, according to this embodiment, the zoom speed corresponding to each movement magnitude of the control lever can be changed by a user's liking. Zoom speed is controlled by which velocity level now, or judgment becomes possible easily.

[0041](A 2nd embodiment) The imaging device which showed this embodiment to a 1st embodiment enables still picture record of a picture.

[0042] Drawing 9 is a configuration block figure of the imaging device of this embodiment, and drawing 10 and drawing 11 are the perspective views of the imaging device of this embodiment.

[0043] In drawing 9, mode change SW16 is a switch which switches the mode of record/reproduction of an imaging device, make it record on the recording medium 9 at the time of a recording mode, and a taken image at the time of reproduction mode. It is possible to read the image data memorized in the recording medium, and to display a picture on the indicator 8. Mode change SW16 is making control of ON/OFF of the power supply of the main part of an imaging device serve a double purpose. 17 is an external output terminal and is outputting the imaging data processed by the video signal processing circuit 6.

[0044] Since the composition of other numerals is the same as the composition of the numerals shown in drawing 1, respectively, the explanation is omitted.

[0045] Drawing 12 is an operation processing flow chart of the microcomputer 1 when a control lever is operated in the imaging device of this embodiment.

[0046] First, in s40, it is judged whether the power supply is inputted. When it is judged that the power supply is inputted, it progresses to s41 and it is judged whether mode change SW16 is a recording mode or it is reproduction mode. When judged as a recording mode, processing of s30-s34 is performed. Since processing of s30-s34 is the same as the processing shown in drawing 3, the explanation is omitted.

[0047] On the other hand, in s41, when it is judged that it is reproduction mode, the picture first recorded on the indicator 8 is displayed, and it progresses to s42. In s42, the output change of the potential of the variable resistor by the control lever 13 having been operated is detected. In s43, the movement zone of the control lever 13 is judged with reference to the table (drawing 6) memorized by RAM15.

[0048] In s44, although the zoom speed level is set up corresponding to the movement zone of the control lever, the top feed rate of the reproduced image outputted from the recording medium 9 by the velocity level proportional to the zoom speed level is determined. In s45, the recorded reproduced image is displayed in order based on the determined top feed rate.

[0049] The picture recorded on the forward direction to the time-axis in this embodiment while the control lever 13 was moving in the direction of T is reproduced, While the control lever 13 is moving in the direction of W, the picture recorded on the opposite direction to the time-axis shall be reproduced, but it is not this limitation.

[0050] In this embodiment, as explained above, since it is made to serve a double purpose as a top delivery control switch of the still picture which reproduces a zoom switch at the time of reproduction mode and the number of switches can be lessened, the miniaturization of an imaging device can be realized and operativity can be improved. Since the top feed rate of a still picture is determined corresponding to the zoom speed according to the movement magnitude from the stop position of the lever set up beforehand, it is not necessary to newly set up the top feed rate of the still picture corresponding to the movement magnitude of the control lever.

[0051] In a 1st and 2nd embodiment, although the zooming means which adjusts a field angle used the optical means, even if the electronic zoom which performs zoom electronically is used or it makes optical zoom and electronic zoom serve a double purpose, of course, it is possible to apply this embodiment.

[0052]In a 1st and 2nd embodiment, a setting-out means corresponds to a zoom speed configuration switch group, the microcomputer 1, and the status signal generation circuit 2. A zooming means corresponds to the microcomputer 1, the lens drive circuit 14, and the lens unit 3. A detection means corresponds to the variable resistor 701. A displaying means corresponds to the indicator 8. A velocity level displaying means corresponds to the status signal generation circuit 2, the adder circuit 7, and the indicator 8. A recording device corresponds to the record reproduction circuit 10 and the recording medium 9. A control means corresponds to the microcomputer 1.

[0053]

[Effect of the Invention]As explained above, setting out of the zoom speed suitable for a photography person's liking is possible according to the movement magnitude from the stop position of a control lever. Since the present zoom speed is displayed on an indicator, it can be judged easily with which zoom speed level it is operating to the user.

[0054]Since the top delivery lever which reproduces the still picture recorded as the control lever which performs zoom control one by one is made to serve a double purpose in a still picture when record reproduction is possible, the miniaturization of a device is realizable.

[Translation done.]

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CLAIMS

[Claim(s)]

[Claim 1]An imaging device comprising provided with a zooming means to which image pick-up magnification is changed:

A control lever for inputting said zoom control instructions into said zooming means by moving.

A setting-out means to set up a variation speed level of image pick-up magnification corresponding to a movement zone of said control lever.

[Claim 2]An imaging device, wherein it has a detection means to detect a movement zone of said control lever, in claim 1, and said zooming means is constituted so that image pick-up magnification may be changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection means.

[Claim 3]Claim 2 comprising:

A displaying means for displaying a taken image.

A velocity level displaying means for displaying a variation speed level of image pick-up magnification controlled by said zooming means on said displaying means.

[Claim 4]Have a memory measure which memorizes a variation speed level of image pick-up magnification set up by said setting-out means in claim 2 respectively corresponding to a movement zone of said control lever, and said zooming means, An imaging device characterized by changing image pick-up magnification with a variation speed level called by calling a variation speed level of image pick-up magnification corresponding to a movement zone of said detected control lever from said memory measure.

[Claim 5]An imaging device, wherein setting out of a variation speed level of image pick-up magnification by said setting-out means is constituted in claim 3 so that it can set up on said displaying means.

[Claim 6]An imaging device, wherein said imaging device is provided with a recording device for recording a still picture in any 1 paragraph of claim 1 thru/or claim 5.

[Claim 7]An imaging device provided with a control means which switches an output of a still picture recorded in claim 6 when said imaging device was in image restoration mode one by one according to movement of said control lever.

[Claim 8]An imaging device, wherein said control means is constituted in claim 7 so that an output of a still picture may be switched one by one in proportion to a variation speed level of image pick-up magnification set up by said setting-out means.

[Claim 9]In a control method of an imaging device provided with a zoom process of enabling change of image pick-up magnification, It corresponds to a movement zone of a control lever for inputting said zoom control instructions into said zoom process, Have a setting-out process of setting up a variation speed level of image pick-up magnification, and a detection process which detects a movement zone of said control lever, and said zoom process, A control method of an imaging device performing processing to which image pick-up magnification is changed with variation speed of image pick-up magnification corresponding to a movement zone of said control lever detected by said detection process.

[Claim 10]A control method of an imaging device provided with a control process of switching an output of a still picture recorded when it was in image restoration mode which reproduces a still picture in which said imaging device could record a still picture, and was recorded in claim 9 one by one according to movement of said control lever.

[Claim 11]In a storage which memorized a program which performs operation processing of an imaging device provided with a zoom processing function to change image pick-up magnification, It corresponds to a movement zone of a control lever for inputting zoom control instructions, A storage which memorized a program which performs processing to which image pick-up magnification is changed with variation speed of image pick-up

magnification corresponding to a movement zone of said control lever which made a variation speed level of image pick-up magnification set up, was made to detect a movement zone of said control lever, and was made to detect.

[Claim 12] A storage which memorized a program which performs processing to which an output of a still picture recorded when it was in image restoration mode which reproduces a still picture in which said imaging device could record a still picture, and was recorded in claim 11 is made to be switched one by one according to movement of said control lever.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram of the imaging device of an embodiment of the invention.

[Drawing 2] The operation processing flow chart of the imaging device of this embodiment.

[Drawing 3] The operation processing flow chart of the imaging device of this embodiment.

[Drawing 4] The figure showing an example of the display screen of the imaging device of this embodiment.

[Drawing 5] The figure showing an example of the display screen at the time of zoom speed setting out of the imaging device of this embodiment.

[Drawing 6] The figure showing an example of the table showing correspondence with a control-lever position and zoom speed.

[Drawing 7] The figure showing an example of division of the position of a control lever.

[Drawing 8] The figure showing the easy composition which detects the position of a control lever.

[Drawing 9] The block diagram of the imaging device of an embodiment of the invention.

[Drawing 10] The perspective view of the imaging device of an embodiment of the invention.

[Drawing 11] The perspective view of the imaging device of an embodiment of the invention.

[Drawing 12] The operation processing flow chart of the imaging device of this

embodiment.

[Description of Notations]

- 1 Microcomputer
- 2 Status signal generation circuit
- 3 Lens unit
- 7 Adder circuit
- 8 Indicator
- 9 Recording medium
- 10 Record reproduction circuit
- 12 Zoom speed configuration switch group
- 13 Control lever
- 14 Lens drive circuit
- 15 RAM
- 16 Mode change SW
- 18 ROM

[Translation done.]

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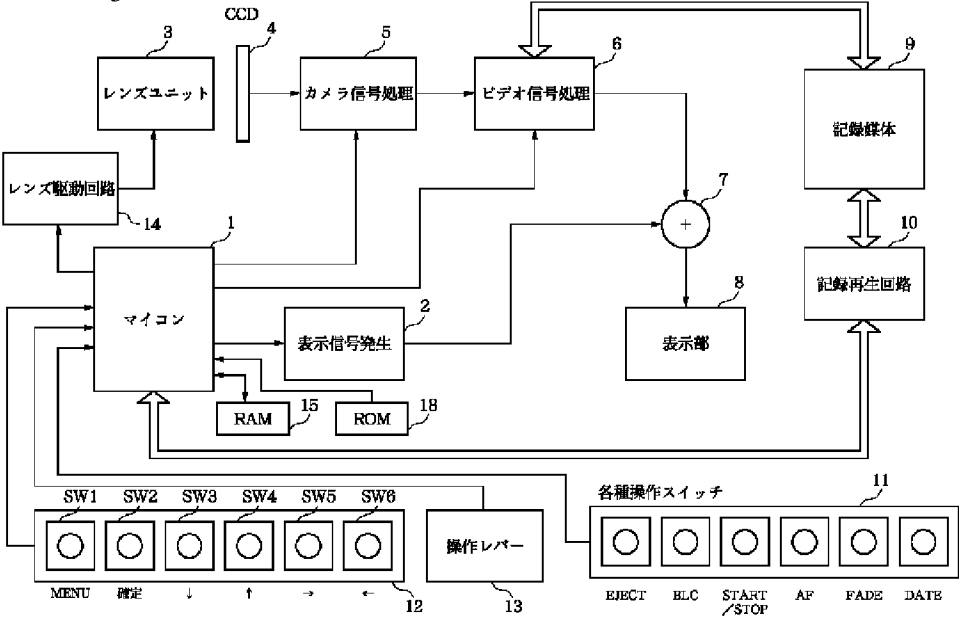
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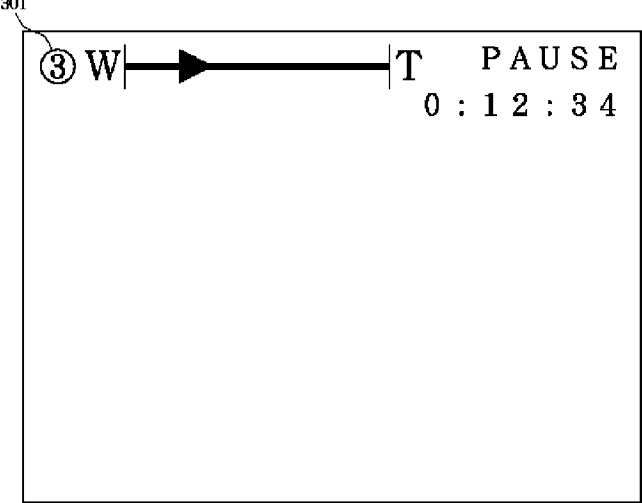
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DRAWINGS

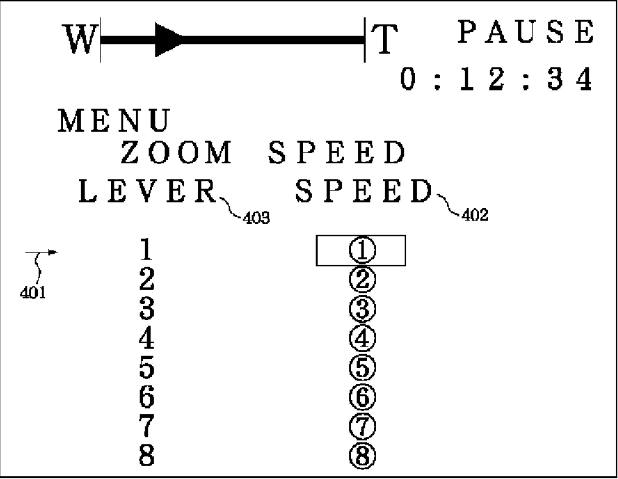
[Drawing 1]



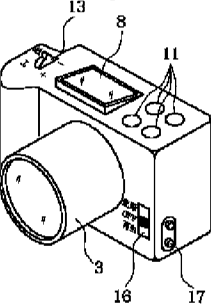
[Drawing 4]



[Drawing 5]



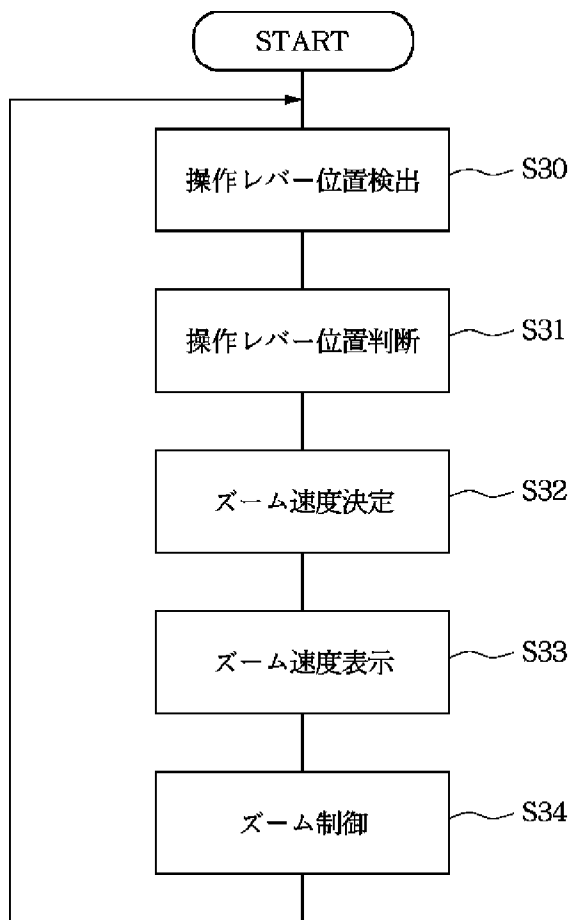
[Drawing 10]



[Drawing 2]



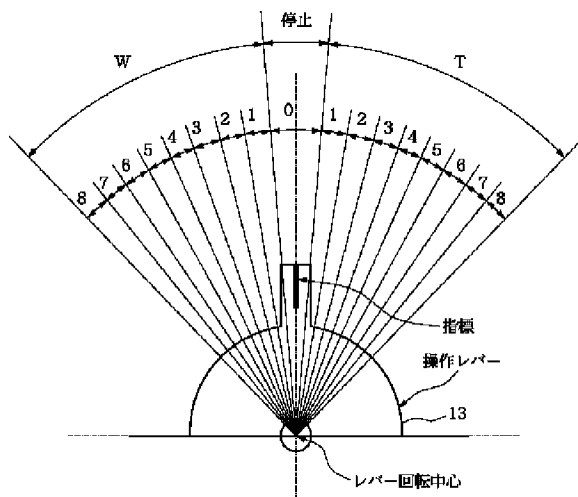
[Drawing 3]



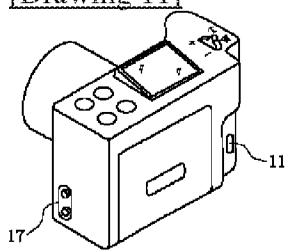
[Drawing 6]

レバー移動位置	検出レベルV $v = VCC / 18$	設定時のズーム動作	ズーム速度レベル
ワイド 8	$VCC \geq v > 17v$	標準速度の8倍でワイド方向に移動	⑧
ワイド 7	$17v \geq v > 16v$	標準速度の7倍でワイド方向に移動	⑦
ワイド 6	$16v \geq v > 15v$	標準速度の6倍でワイド方向に移動	⑥
ワイド 5	$15v \geq v > 14v$	標準速度の5倍でワイド方向に移動	⑤
ワイド 4	$14v \geq v > 13v$	標準速度の4倍でワイド方向に移動	④
ワイド 3	$13v \geq v > 12v$	標準速度の3倍でワイド方向に移動	③
ワイド 2	$12v \geq v > 11v$	標準速度の2倍でワイド方向に移動	②
ワイド 1	$11v \geq v > 10v$	標準速度でワイド方向に移動	①
停止 0	$10v \geq v > 8v$	ズーム動作停止	⑨
テレ 1	$8v \geq v > 7v$	標準速度でテレ方向に移動	①
テレ 2	$7v \geq v > 6v$	標準速度の2倍でテレ方向に移動	②
テレ 3	$6v \geq v > 5v$	標準速度の3倍でテレ方向に移動	③
テレ 4	$5v \geq v > 4v$	標準速度の4倍でテレ方向に移動	④
テレ 5	$4v \geq v > 3v$	標準速度の5倍でテレ方向に移動	⑤
テレ 6	$3v \geq v > 2v$	標準速度の6倍でテレ方向に移動	⑥
テレ 7	$2v \geq v > 1v$	標準速度の7倍でテレ方向に移動	⑦
テレ 8	$1v \geq v \geq 0v$	標準速度の8倍でテレ方向に移動	⑧

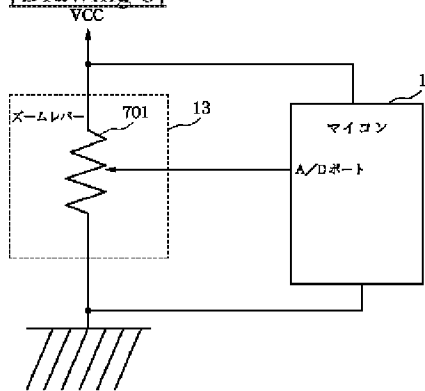
[Drawing 7]



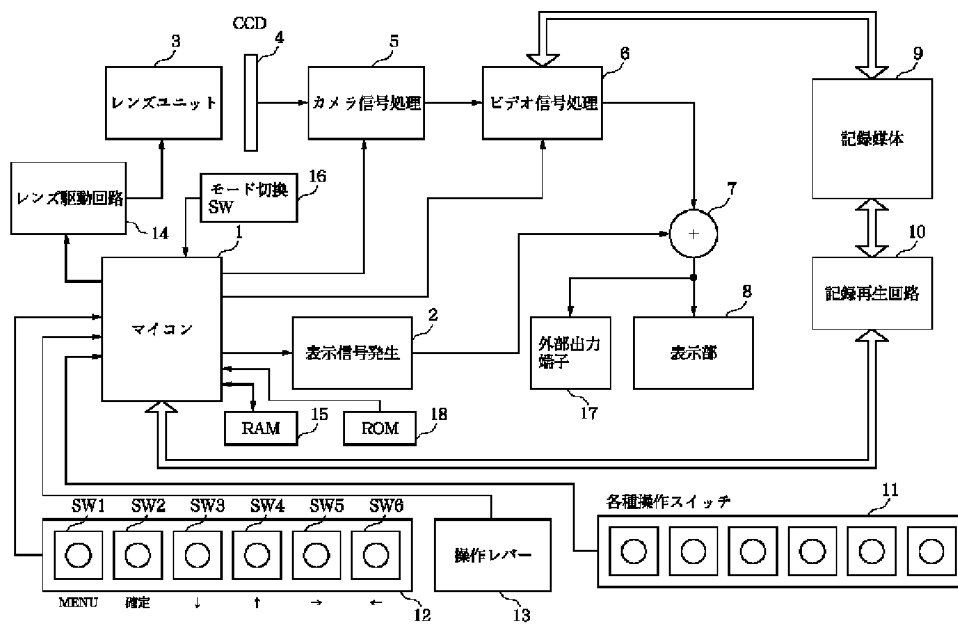
[Drawing 11]



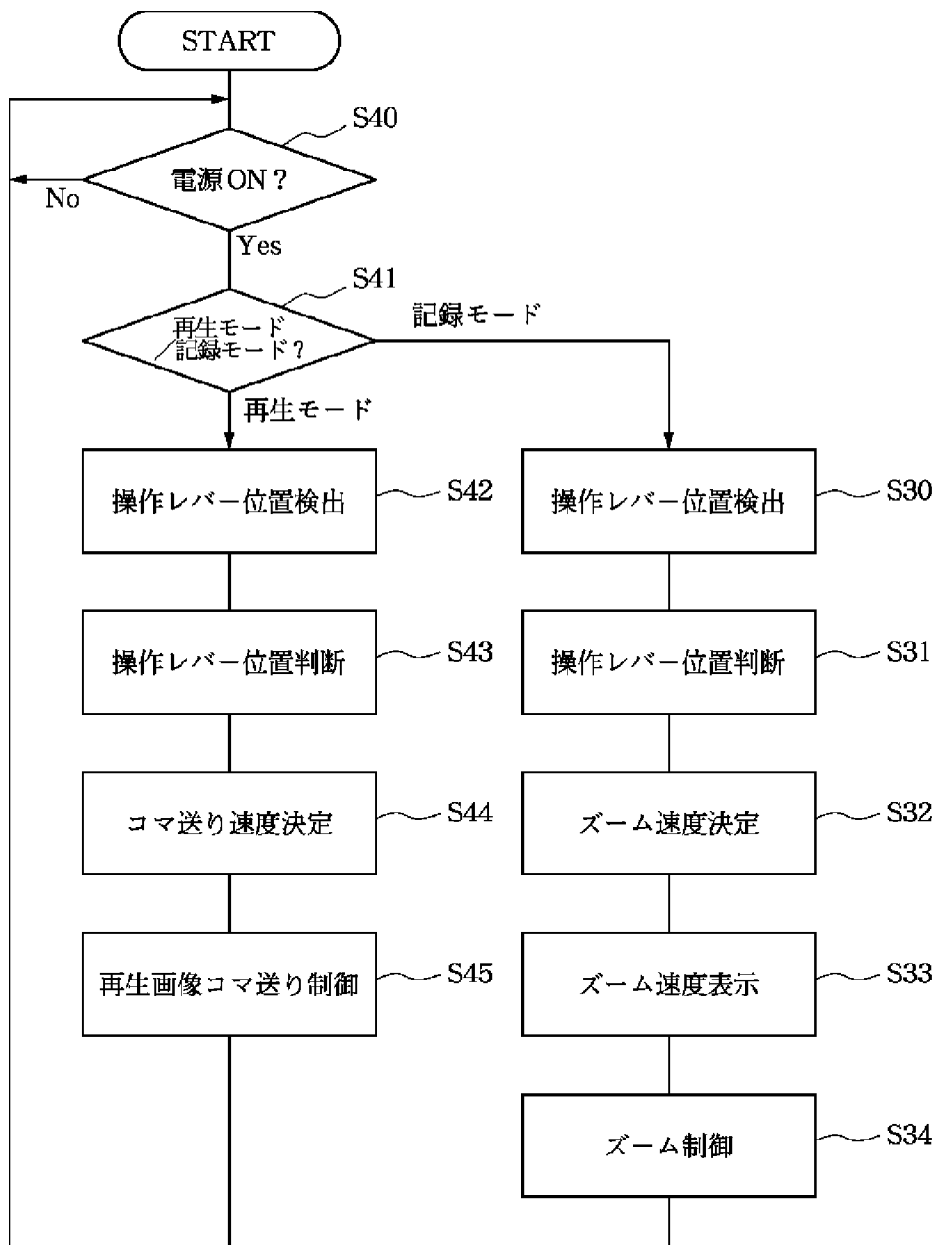
[Drawing 8]



[Drawing 9]



[Drawing 12]



[Translation done.]